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(54) Abstract Title
Portable Self Diagnosis Unit

(57) A hand held apparatus for simplifying self diagnosis, has a set of user input keys 2 each displaying a medical symptom, condition or other relevant information (eg gender, age, height, weight etc.) and sensing devices for measuring another physical parameter indicative of physiological condition (eg temperature 64, heart rate 70/72, pulse 76/78). Diagnostic information is stored in the unit and an output is generated on display 10 in response to the medical symptoms entered and the physiological parameter measured. The unit can be connected to an external display, printer or terminal via interface 68.

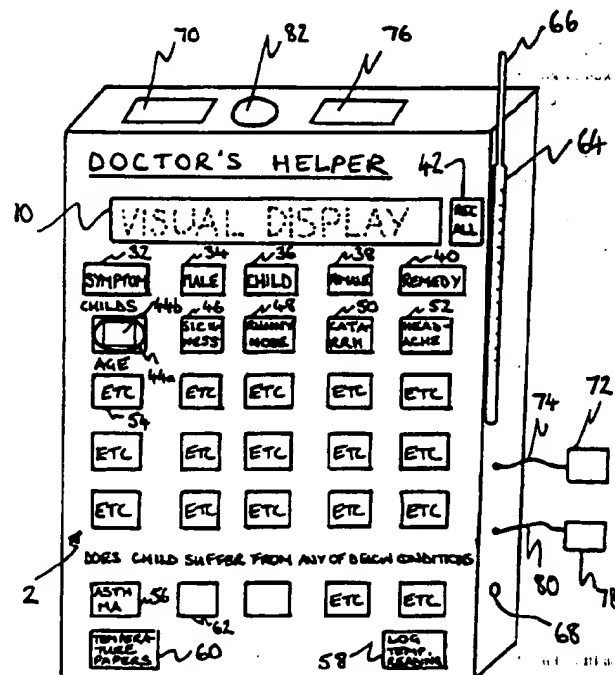
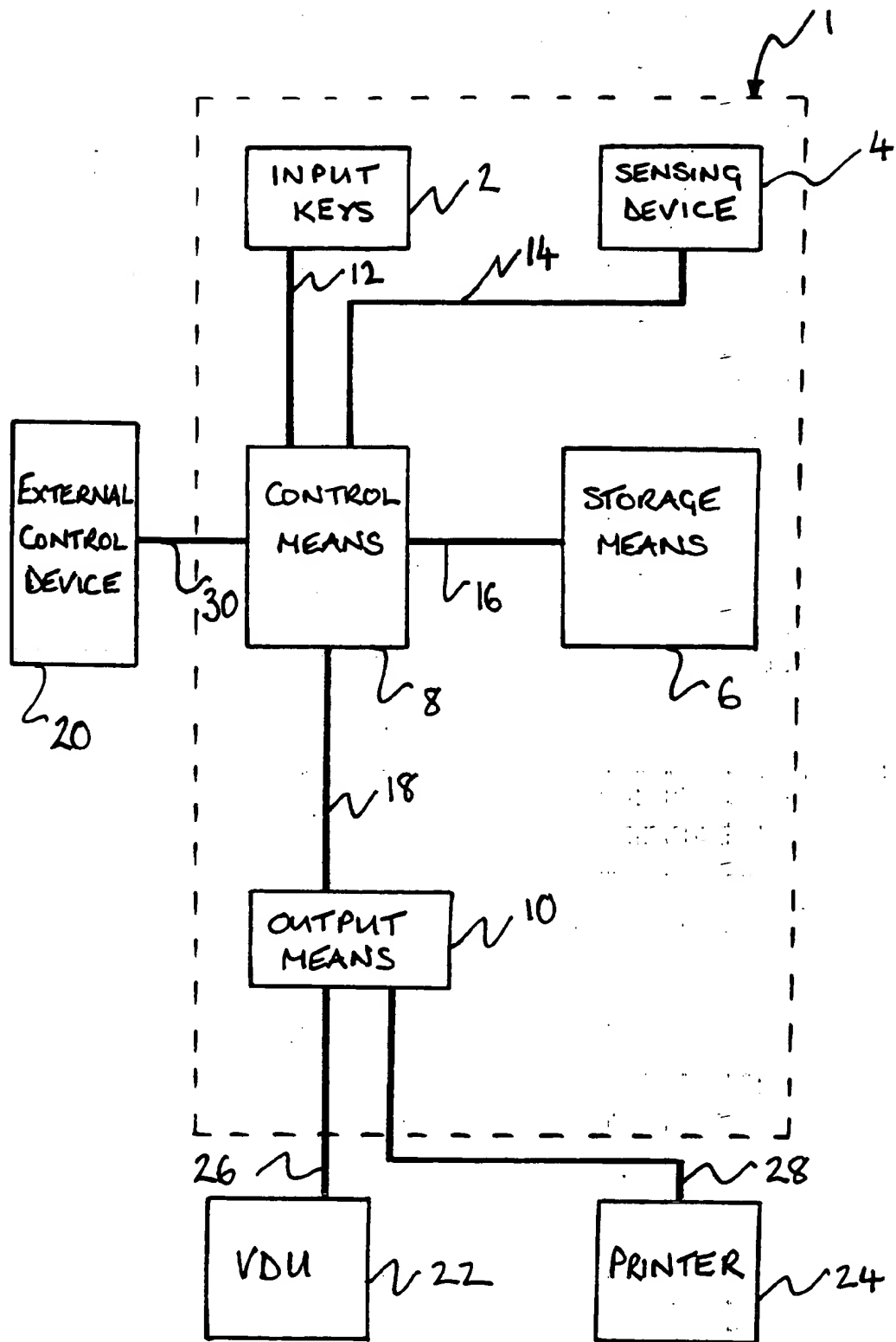


FIG 2.

At least one of

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FIG 1.

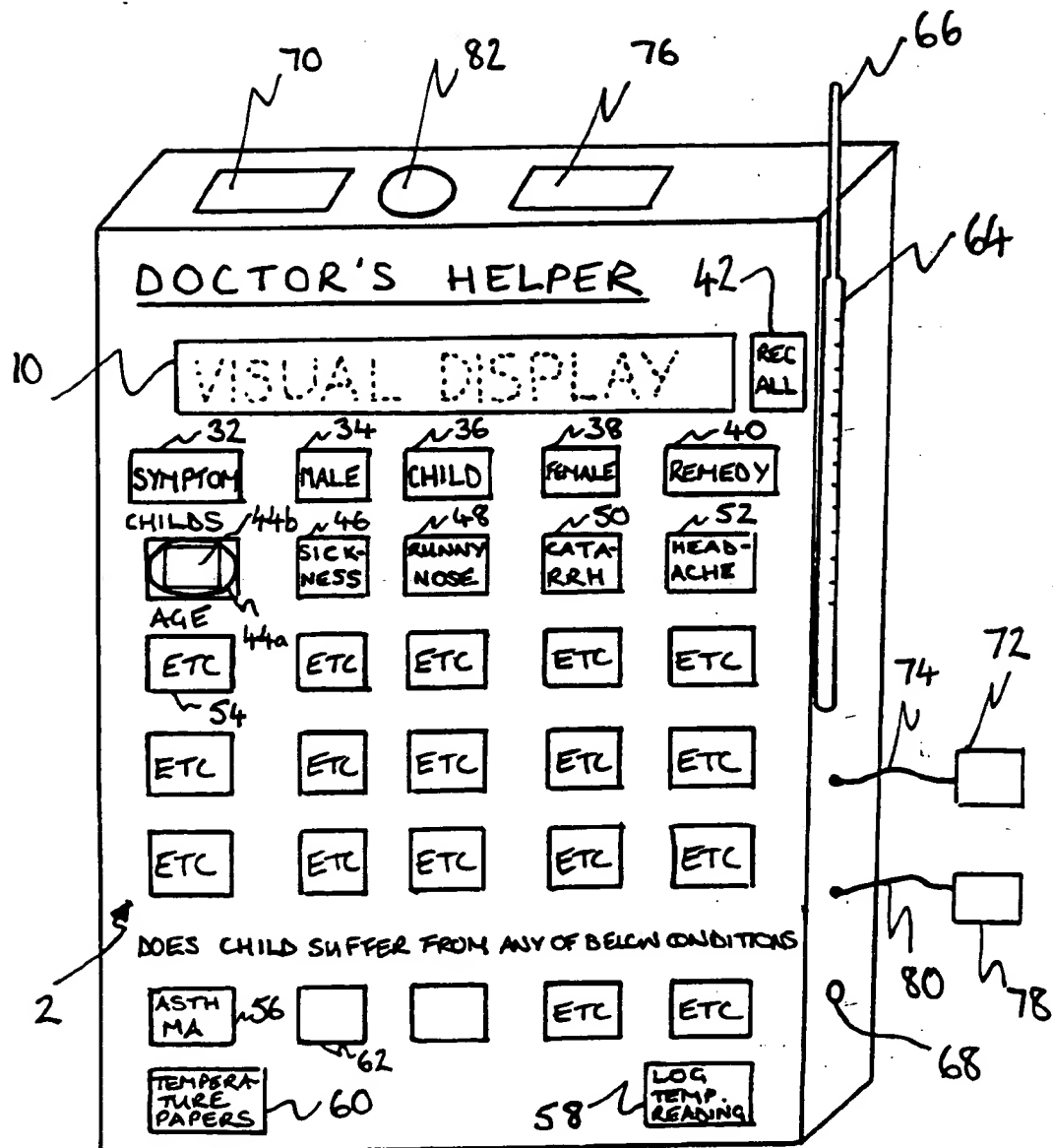


FIG 2.

DIAGNOSTIC APPARATUS

The present invention relates to a diagnostic apparatus comprising a portable unitary body for diagnosing an advisory course of treatment based on the medical symptoms of a user.

It is becoming increasingly difficult for the general public to receive quick access to a doctor when they are suffering from less than serious complaints. Typically, an individual suffering from a less than serious complaint may have to wait several days before an appointment to visit a doctor for a consultation become available.

Having to wait several days before being able to consult a doctor may result in an individual becoming anxious or distressed. This may particularly be the case when a parent has to wait several days before they can take a sick child for a consultation with a doctor.

Furthermore, the demand from individuals suffering from very minor complaints for consultations with a doctor puts increasing pressure on a doctor's time, resulting in still longer delays for those waiting for appointments. Adults suffering from relatively minor complaints may be able to avoid a consultation with the doctor if they were able to readily identify an 'over-the-counter' non-prescription treatment for their condition. Individuals suffering from such minor complaints, whom upon visiting a doctor would be quickly diagnosed and advised to take a course of non-prescription medication/treatment, would no longer put a burden on doctor's time if they were able to readily diagnose themselves. Freeing up the doctor's time in this way would contribute, to some extent, in enabling people with more serious complaints to have quicker access to a doctor.

Thus it is an object of the present invention to provide a portable diagnostic apparatus, suitable for use by individuals with no specialist medical knowledge, for identifying a course

of treatment in dependence on symptoms being exhibited.

Thus according to the present invention there is provided diagnostic apparatus comprising a portable unitary body having a plurality of user input keys each displaying one of a plurality of medical symptoms by means of which a user can enter selected medical symptoms, at least one sensing device for sensing a parameter of a user indicative of a physiological condition, storage means for storing diagnostic information, control means for controlling access to the diagnostic information responsive to the medical symptoms and physiological conditions input by the user and output means for outputting the accessed diagnostic information in the form of user readable text.

In addition to providing user input keys for inputting different medical symptoms, it is desirable to further be able to input ongoing medical conditions suffered by a user, for example asthma. Thus preferably the diagnostic apparatus further includes a plurality of user input keys each displaying one of a plurality of medical conditions by means of which the user can enter selected medical conditions.

It would further be advantageous to be able to input physical parameters associated with the user, such as the gender of the user or whether the user is a child or an adult. Thus preferably the diagnostic apparatus further includes a plurality of user input keys each displaying one of a plurality of physical parameters by means of which the user can enter selected physical parameters.

Where the user is a child, or an adult entering symptoms for a child, it would be advantageous to be able to input the age of the a child. Age ranges may be displayed on one of the plurality of physical parameter input keys. Alternatively, the present invention may provide a rotatable wheel for selecting a physical parameter of the user. By rotating the wheel different ages of the user can be selected.

A reading of the heart rate or pulse rate of a user is also advantageous in diagnosing certain conditions, and therefore the at least one sensing device may include a heart rate monitor or a pulse rate monitor.

Preferably the output means includes a visual display means on the portable unitary body. Alternatively, or in addition, the output means may further include a printing device on the portable unitary body.

In certain applications it may be advantageous to be able to access the diagnostic information additionally via means external to the portable unitary body. The output means may be adapted to interface with the remote monitor or remote printing device.

It may also be advantageous to enable the diagnostic information stored in the storage means to be updated and/or varied. The updating of the storage means may be desirable particularly if new treatments become available at a later date. The input means may be adapted to provide access to the storage means by an external device. Thus the external device may be used to update or alter the storage means.

Similarly it may be advantageous to access the storage means of the diagnostic apparatus to check the diagnostic information

For a better understanding of the present invention to show how the same may be carried into effect, reference will now be made by way of example to the accompanying drawings, in which:

Figure 1 is a block diagram of a diagnostic apparatus according to the present invention additionally illustrating optional connections to external devices; and

Figure 2 is a diagram of a preferable embodiment of the diagnostic apparatus illustrating alternative sensing means attached thereto.

Referring to Figure 1 there is shown a block diagram of a diagnostic apparatus according to a preferable embodiment of the present invention. The diagnostic apparatus 1 includes input keys 2, at least one sensing device 4, control means 8, storage means 6, and output means 10. In addition in Figure 1 there is shown external devices which the diagnostic apparatus may optionally interface with. The external devices shown in Figure 1 are an external control device 20, a visual display unit (VDU) 22, and a printer 24.

The input keys 2 are connected to the control means 8 via bi-directional signal lines 12, and the sensing device 4 is connected to the control means 8 via bi-directional signal lines 14. The output means 10 is connected to the control means via bi-directional signal lines 18. The storage means 6 is connected to the control means 8 via bi-directional signal line 16.

In use, and as will be more fully explained with reference to Figure 2 hereinbelow, a user inputs via the input keys 2 at least one medical symptom. In addition the user may input via the input keys 2 their gender, age, or other medical conditions which they may suffer from such as asthma. Once selected, the various

In dependence on the input signals on signal lines 12 and 14 the control means 8 sets control signals on line 16 to the storage means 6, to access diagnostic information stored in the storage means 6. The appropriate diagnostic information stored in the storage means 6 is returned to the control means via the bi-directional control signal 16. Once the control means 8 has received the diagnostic information from the storage means 6, it communicates the diagnostic information to the output means 10 via signal lines 18.

The output means 10 will, in this preferable embodiment, comprise a visual display on the diagnostic apparatus, such as an LCD display, the diagnostic information being displayed thereon. In addition, the output means may include a printing device on the diagnostic apparatus, for giving a print out of the diagnostic information which may be taken by the user to a pharmacy to purchase the appropriate treatment.

It is desirable to be able to update the storage means 6 in the diagnostic apparatus 1 after it has initially been programmed. Thus the control means 8 is adapted to be provided with a bi-directional communications link 30 to the external control device

In addition there may be applications where in addition to displaying the diagnostic information on the visual display or printing device of the output means 10, it is also desirable to display such information on an external remote device. Thus in Figure 1 there is shown two possible implementations where the output means 10 additionally interfaces via a communications link 26 to the VDU 22, and via the communications link 28 to the printer 24. In one embodiment the communications link 26 to the VDU 22 will be wireless, and the VDU 22 may be implemented using a television screen.

It will also be clear to one skilled in the art that the present invention may be implemented using a variety of different configurations of control circuits other than that shown in Figure 1 for the diagnostic apparatus. For example, the signal lines 12 and 14 from the input keys 2 and sensing device 4 respectively may form inputs directly to the storage means 6, and the output means 10 may be connected directly via signal lines 18 to the storage means 6.

Referring now to Figure 2 there is shown a possible implementation of the diagnostic apparatus comprising a portable unitary body according to the present invention. As can be seen the diagnostic apparatus 1 includes the output means 10 consisting of a visual display, and a plurality of user input keys, generally designated as 2, for inputting various parameters.

A plurality of user input keys each displaying one of a plurality of medical symptoms by means of which a user can enter selected medical symptoms is shown. For instance, input key 46 is used to input a symptom of "sickness", input key 48 is used to input a symptom of a "runny nose", input 50 is used to input a symptom of "catarrh", and input key 52 is used to input a symptom of a "headache". Various other input keys, such as input key 54, can be used for inputting any other symptoms which may be identified on the input keys. After completing inputting all the symptoms, the user may press a "symptoms" key 32. Once the symptoms, and any other parameters as discussed hereafter, are input, the user presses a "remedy" key 40 and the diagnostic apparatus calculates and outputs the diagnosis.

In addition the diagnostic apparatus preferably includes a plurality of user input keys each displaying one of a plurality of medical conditions, by means of which the user can enter selected medical conditions. For instance input key 56 can be used to indicate that the user suffers from asthma. Other input keys such as input key 62 may be used for indicating other conditions identified thereon.

The diagnostic apparatus 1 also preferably includes a plurality of user input keys each displaying one of a plurality of physical parameters by means of which the user can enter selected physical parameters. For instance, user input key 34 is used to input that the user is male, user input key 36 identifies that the user is a child, and user input key 38 indicates that the user is female. Another physical parameter it is desirable to input, particularly for a child, is an age. This may be done by providing additional user input keys displaying age ranges as physical parameters. In the embodiment of Figure 2 there is shown a rotatable wheel 44a, which when rotated displays different child ages on a display 44b.

The diagnostic apparatus 1 of Figure 2 is also fitted with, in one embodiment, a temperature sensing device 64 for sensing the

temperature of the user. In the embodiment of Figure 1 the sensing device 64 is fixed to the diagnostic apparatus 1, such that the diagnostic apparatus 1 may be placed under the arm of the user with the temperature sensing device 64 in contact with the user. The diagnostic apparatus then senses the temperature of the user. After the temperature sensing device 64 has been placed under the users arm for a sufficient length of time, the user logs the temperature reading of the temperature sensor 64 using the input key 58. Other means for sensing the temperature of the user may be used. For instance, the temperature sensing device 64 may be extendable using retractable means 66, so that temperature may be sensed using more conventional means by placing the retractable means 66 of the temperature sensing means 64 in the patients mouth. The temperature sensing means 64 or the retractable means 66 may be swivably mounted on the diagnostic apparatus 1. It will be understood, in any event, that the temperature sensing means is adapted such that the temperature reading is registered in the diagnostic apparatus automatically on keying the user input key 58 to log the temperature reading, and not by the user having to input a temperature read off the temperature sensor 64.

The temperature of the user may also be input by using the temperature tissue papers 60 stored in the diagnostic apparatus 1. The temperature reading given on the tissue would then be input, using the keypad, into the diagnostic apparatus.

Other sensing devices may be attached to the diagnostic apparatus for sensing parameters indicative of a user's physiological condition. For instance, a sensing device comprising a heart rate monitor may be incorporated into the diagnostic apparatus. In the embodiment of Figure 2, there is shown one possible implementation of a heart rate sensor 70. The sensor 70, mounted on the side of the apparatus is preferably raised relative to the surface of the apparatus, and can be held by the user against their chest for the appropriate sensing. Alternatively, the heart rate sensor may be provided using a sensor 72 fixed by a

A sensing device including a pulse rate detector may be incorporated into the diagnostic apparatus. In the embodiment of Figure 2 there is shown one possible implementation of a pulse rate detector 76. The detector 76, mounted on the side of the apparatus is preferably raised relative to the surface of the apparatus, and can be held by the user against, for example, their wrist to monitor their pulse rate. Alternatively, the pulse rate sensor may be provided using a sensor 78 fixed by a wire 30 to the apparatus 1.

A 'blow-hole' 82 may also be provided as a sensing means. This may be used for temperature sensing or even for alcohol level detection. The 'blow-hole' 82 may be provided with a tube or raised peripheral area for blowing into.

It will be appreciated that various other types of sensing means may be incorporated into the diagnostic apparatus according to the invention.

The diagnostic apparatus 1 of Figure 2 is also preferably provided with an interface connection 68, which may provide the appropriate connections shown in Figure 1 to the external control device 20, VDU 22, or printer 24.

The diagnostic information provided by the storage means of the diagnostic apparatus via the output means will, preferably, be a temporary relief instruction advising the user of appropriate "over the counter" non-prescription remedies which should be obtained from a pharmacy. Alternatively, the diagnostic information may merely give an assessment of the users condition, such as outputting information giving the user an indication of the complaint they are suffering from, such as "flu-like complaint".

The device is preferably a hand-held pocket sized device, the

size of the device primarily being dictated by the number of input keys or the size/number of sensing devices. Different types of units may be used for different applications, having different inputs to select from on the input keys.

Although the diagnostic apparatus has been described, in the preferable embodiment, as a hand-held apparatus, it may also be provided in larger portable sizes for specific applications. Specific applications are envisaged where the diagnostic apparatus may be provided as a desk-top or upright floor standing apparatus provided in doctor's waiting rooms, shopping malls or other publicly accessible areas. In such other applications the diagnostic apparatus may be securely fixed to prevent damage or theft.

The diagnostic apparatus, in the embodiment described herein with reference to Figure 1 and 2, is primarily intended for use in a domestic environment. However, the diagnostic apparatus may have applications in more specific or specialised areas. For instance the device may be used in shopping malls, first aid centres, or Hospital training centres.

The diagnostic apparatus could also be produced for dealing with specific ailments or injuries.

In an alternative arrangement, the diagnostic apparatus is used to diagnose the physical condition of the user. In this arrangement, the plurality of user input keys each displaying one of a plurality of medical symptoms are replaced by user input keys each displaying a parameter related to the diet or the amount of exercise taken by the user. The storage means 6 of Figure 1 stores diagnostic information concerning the future health or fitness in dependence on the dietary or exercise variables input. Thus, the diagnostic apparatus may output, in dependence on the inputs, an indication of what health problems the users current exercises or diet may result in the future, for example one year or two years time.

1. Diagnostic apparatus comprising a portable unitary body having:

a plurality of user input keys each displaying one of a plurality of medical symptoms by means of which a user can enter selected medical symptoms;

at least one sensing device for sensing a parameter of a user indicative of a physiological condition;

storage means for storing diagnostic information;

control means for controlling access to the diagnostic information responsive to the medical symptoms and physiological conditions input by the user; and

output means for outputting the accessed diagnostic information in the form of user readable text.

2. Diagnostic apparatus according to claim 1 further including a plurality of user input keys each displaying one of a plurality of medical conditions by means of which the user can enter selected medical conditions.

3. Diagnostic apparatus according to either claim 1 or claim 2 further including a plurality of user input keys each displaying one of a plurality of physical parameters by means of which the user can enter selected physical parameters.

4. Diagnostic apparatus according to any preceding claim further including a rotatable wheel for selecting a physical parameter of the user.

5. Diagnostic apparatus according to any preceding claim in which the at least one sensing device includes a temperature

sensor.

6. Diagnostic apparatus according to the claim 5 in which the temperature sensor is extendable from the portable unitary body.
7. Diagnostic apparatus according to any preceding claim in which the at least one sensing device includes a heart rate monitor.
8. Diagnostic apparatus according to any preceding claim wherein the at least one sensing device includes a pulse rate monitor.
9. Diagnostic apparatus according to any preceding claim in which the output means includes a visual display.
10. Diagnostic apparatus according to any preceding claim in which the output means includes a printing device.
11. Diagnostic apparatus according to any preceding claim in which the output means is adapted to interface with a remote monitor or remote printing device.
12. Diagnostic apparatus according to any preceding claim in which the input means is adapted to provide access to the storage means by an external device.
13. Diagnostic apparatus according to any preceding claim in which the output means is adapted to provide access to the storage means by an external device.
14. Diagnostic apparatus substantially as described herein with reference to either Figure 1 or Figure 2.



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Claims searched: All

Examiner: Owen Wheeler
Date of search: 16 December 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK CI (Ed.P): G1N (NEAN, NEAX)
G4A (AUXM)

Int CI (Ed.6): A61B: 5/02, 5/0205
G06F: 19/00

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage		Relevant to claims
Y	GB 2210713 A	[IDS] See in particular page 5 last paragraph and page 9 third full paragraph.	10- 12
X Y	GB 2061521 A	[JENKINS] See in particular page 2 lines 18-25 and page 3 lines 1-8 and 37-40	X 1-3, 7- 9 Y 10-12
Y	US 4290114	[SINAY] See abstract. And Fig 1.	10

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
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&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.